Trend Study 9-25-05

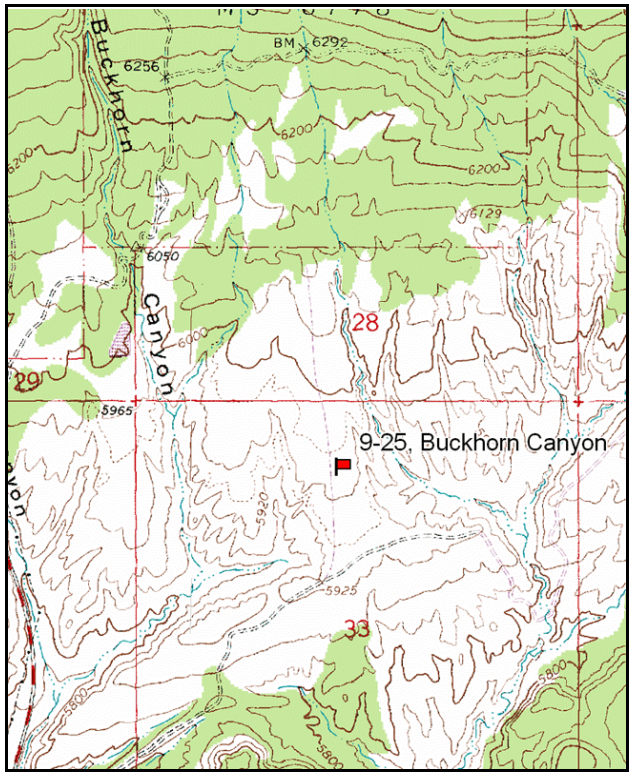
Study site name: Buckhorn Canyon . Vegetation type: Wyoming Big Sagebrush .

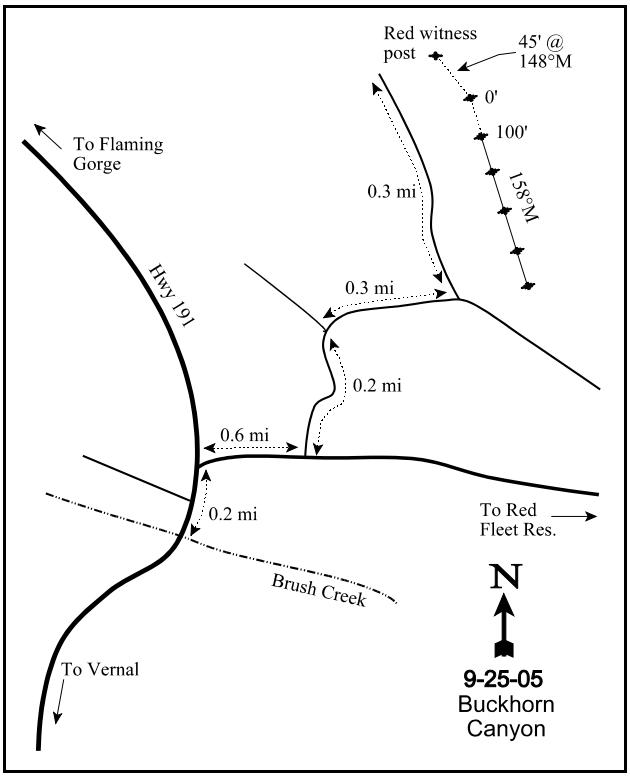
Compass bearing: frequency baseline 158 degrees magnetic.

Frequency belt placement: line 1(11ft), line 2(34 ft), line 3(59 ft), line 4(71 ft), line 5 (95 ft).

LOCATION DESCRIPTION

From Vernal proceed north on Highway 191. After Highway 191 crosses brush creek continue 0.2 miles and turn right onto the road that leads to Red Fleet Reservoir. On this road proceed 0.6 miles. Turn left onto a dirt road. Go 0.2 miles to a fork. Turn right and go 0.3 miles to another fork. Turn left and go 0.3 miles. The witness post is a red full high fence post about 50 feet to the east. The 0-foot stake is 45 to the south at 148 degrees magnetic. The 0' stake is marked with browse tag #120.





Map name: Donkey Flat

Diagrammatic Sketch

Township 3N , Range 22E , Section 33

GPS: NAD 27, UTM 12T 4495926 N 630959 E

DISCUSSION

Buckhorn Canyon - Trend Study No. 9-25

The Buckhorn Canyon study is located approximately 11 miles north of Vernal off Highway 191. The study was established in 2001 to monitor winter use by big game, primarily mule deer. The study lies on a gentle (1-2%) south-facing slope at an elevation of 5,970 feet. Deer use is heavy, with use by elk and livestock being much lighter. Pellet group data from 2001 estimated 175 deer, 28 elk, and 28 cow days use/acre (431 ddu/ha, 69 edu/ha, and 69 cdu/ha). A lot of the pellet groups sampled had been displaced by runoff and overland flow. Pellet group data from 2005 estimated 37 deer, 11 elk, and 29 cow days use/acre (91 ddu/ha, 26 edu/ha, and 72 cdu/ha). This study is managed by the BLM and is within the Brush Creek allotment.

Soils have a clay loam texture and a slightly alkaline pH (7.7). Effective rooting depth was estimated just over 13 inches. Rock and pavement occur in very low amounts. There is a layer of stone found between 8 and 12 inches below the surface. Phosphorus and potassium are both low at 4.1 ppm and 57.6 ppm, respectively. Values lower than 6 ppm for phosphorus and 60 ppm for potassium may limit plant growth and development (Tiedemann and Lopez 2004). Low amounts of herbaceous vegetation and litter cover with high amounts of bare ground allow significant erosion to occur. An erosion condition class assessment categorized soils as having slight erosion in 2005. This classification was due mostly to heavy pedestaling around sagebrush stems and surface litter translocation during recent thunderstorms.

Wyoming big sagebrush is the dominant browse. Sagebrush density was estimated at 4,900 plants/acre in 2001. By 2005 density had decreased to 3,860 plants/acre. Sagebrush averaged 21% cover in 2001, which decreased to only 6% by 2005. Percent decadence was high in 2001 at 49%, but this increased to 61% in 2005. Twenty-two percent of the populaiton was classified as dying in 2001. This increased substantially to 46% by 2005. Recruitment of young plants was low in 2001 at only 2% (80 plants/acre), although this increased to 26% (1,020 plants/acre) in 2005. The increase in the number of young plants should help replace many of the dying population if they are able to persist. Several seedlings were also observed in 2005. Annual leader growth averaged less than 2 inches in 2001. This increased to 3.5 inches in 2005. Utilization has been moderate to heavy, whereas vigor has been fairly poor to poor.

The herbaceous understory is poor. Perennial grasses produced 5.5% cover in 2001 and 7.5% in 2005. Thickspike wheatgrass and needle-and-thread were the most abundant grasses in both years. Other perennial grasses sampled include Sandberg bluegrass, bottlebrush squirreltail, and Indian ricegrass. Needle-and-thread had a patchy distribution, while Sandberg bluegrass was found growing primarily underneath the safety of sagebrush crowns. Cheatgrass cover was less than 1% in both years, but nested frequency increased significantly in 2005. However, these values are still relatively low. Forbs increased substantially in 2005. Annual forb cover was less than 0.5% in 2001, but increased to 9.5% in 2005. Most of the species sampled were weedy species: tansey mustard, annual stickseed, bur buttercup, and Russian thistle. Perennial forbs had similar results, increasing from 1% in 2001 to 5% in 2005. Scarlet globemallow was the main perennial species that increased. A treatment to thin and restore vigor to the sagebrush population, as well as improve understory productivity, should be considered in the future.

2001 APPARENT TREND ASSESSMENT

Soils appear to have a downward trend. Bare soil is high, pedestaling is severe, and displacement of surface litter is very common. Herbaceous cover, which is best at holding soils in place, is low. The Wyoming big sagebrush population is in poor condition with high decadency and poor vigor. This is compounded by moderate to heavy use. Density will likely decline in the future with 22% of the population classified as dying and very low recruitment from young plants. The understory is sparse for a sagebrush community and will probably not improve without some type of mechanical treatment to thin the sagebrush population and restore

some of the herbaceous understory. The Desirable Components Index rated this site as fair to good with a score of 44 due to excellent browse cover, high decadency, poor young recruitment, and moderately low perennial grass cover.

winter range condition (DC Index) - Fair to Good (44) Lower Potential scale

2005 TREND ASSESSMENT

Trend for soil is stable. Vegetation, bare ground, and litter all stayed similar to previous values. Cryptograms declined slightly, but the ratio of protective cover to bare ground remained at 2.3 to 1. This value is very low when compared to other sagebrush communities. Trend for key browse Wyoming big sagebrush is down. Density decreased by 21% and percent decadency increased to 61%. Almost half (46%) of the population was classified as dying in 2005. Young recruitment increased from 2% of the population to 26%. Seedlings were very abundant this year. This recruitment may help to reverse the downward trend if they are able to beome established and persist. Trend for the herbaceous understory is slightly down. Sum of nested frequency for perennial grasses were similar to 2001. Cheatgrass increased significantly, although it produced less than 1% cover and still has a quadrat frequency of only 20%. Forbs increased significantly, but most are weedy species. Scarlet globemallow was the only species that increased that was not a weedy increaser. Other dominate forbs include tansey mustard, annual stickseed, bur buttersup, and Russian Thistle. The Desirable Components Index rated this site as fair to good with a score of 44 due to poor browse cover, high decadency. However, the site has excellent recruitment of young, and moderate perennial grass and forb cover.

TREND ASSESSMENT
soil - stable (0)
browse - down (-2)
herbaceous understory - slightly down (-1)
winter range condition (DC Index) - Fair to Good (44) Lower Potential scale

HERBACEOUS TRENDS --
Management unit 09 , Study no: 25

Type	Species	Nested Frequency '01	Nested Frequency '05	Average Cover % '01	Average Cover % '05
G	Agropyron dasystachyum	187	186	2.12	4.30
G	Agropyron intermedium	-	4	-	.03
G	Bromus tectorum (a)	[a]25	[b]52	.09	.58
G	Oryzopsis hymenoides	2	5	.03	.05
G	Poa secunda	106	84	1.23	.94
G	Sitanion hystrix	57	46	.96	.26
G	Stipa comata	50	54	1.07	2.04
Total for Annual Grasses		25	52	0.09	0.58
Total for Perennial Grasses		402	379	5.42	7.64
Total for Grasses		427	431	5.51	8.22
F	Astragalus convallarius	5	5	.19	.28
F	Calochortus nuttallii	11	11	.02	.03

Type	Species	Nested Frequency '01	Nested Frequency '05	Average Cover % '01	Average Cover % '05
F	Chenopodium leptophyllum(a)	-	4	-	.01
F	Collinsia parviflora (a)	-	2	-	.00
F	Cryptantha sp.	-	7	-	.07
F	Descurainia pinnata (a)	$_{a}$50	$_{b}$92	.11	1.21
F	Eriogonum cernuum (a)	-	1	-	.00
F	Gilia sp. (a)	$_{a}$-	$_{b}$15	-	.38
F	Lappula occidentalis (a)	$_{a}$100	$_{b}$323	.21	7.25
F	Lomatium sp.	-	2	-	.00
F	Machaeranthera canescens	2	4	.01	.03
F	Phlox longifolia	$_{b}$124	$_{a}$16	.56	.07
F	Ranunculus testiculatus (a)	$_{a}$9	$_{b}$37	.02	.39
F	Salsola iberica (a)	$_{a}$-	$_{b}$68	-	.37
F	Sphaeralcea coccinea	$_{a}$67	$_{b}$117	.25	4.64
F	Townsendia sp.	20	14	.03	.22
Total for Annual Forbs		159	542	0.35	9.63
Total for Perennial Forbs		229	176	1.07	5.36
Total for Forbs		388	718	1.43	15.00

Values with different subscript letters are significantly different at alpha = 0.10

BROWSE TRENDS --
Management unit 09 , Study no: 25

Type	Species	Strip Frequency '01	Strip Frequency '05	Average Cover % '01	Average Cover % '05
B	Artemisia tridentata wyomingensis	73	80	21.31	6.06
B	Juniperus osteosperma	0	1	1.00	.18
B	Opuntia sp.	14	16	.45	.65
Total for Browse		87	97	22.76	6.89

CANOPY COVER, LINE INTERCEPT --
Management unit 09 , Study no: 25

Species	Percent Cover '05
Artemisia tridentata wyomingensis	7.40
Juniperus osteosperma	.20
Opuntia sp.	.48

KEY BROWSE ANNUAL LEADER GROWTH --
Management unit 09 , Study no: 25

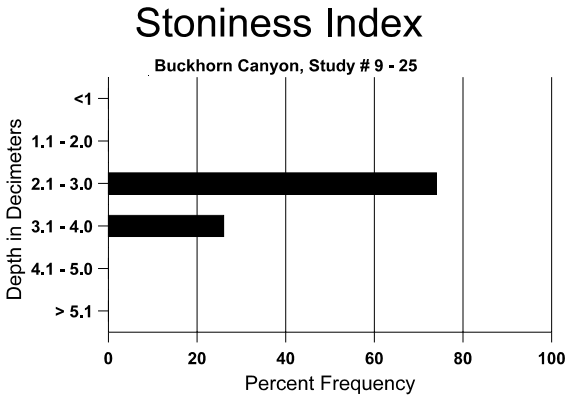
Species	Average leader growth (in) '05
Artemisia tridentata wyomingensis	3.5

BASIC COVER --
Management unit 09 , Study no: 25

Cover Type	Average Cover % '01	'05
Vegetation	27.13	25.62
Rock	.04	.04
Pavement	.46	1.01
Litter	31.23	30.46
Cryptogams	4.40	2.79
Bare Ground	50.20	50.00

SOIL ANALYSIS DATA --
Herd Unit 9, Study no: 25, Buckhorn Canyon

Effective rooting depth (in)	Temp °F (depth)	PH	%sand	%silt	%clay	%0M	ppm P	ppm K	dS/m
13.2	63.0 (13.1)	7.7	35.6	33.8	30.6	1.4	4.1	57.6	0.4



PELLET GROUP DATA --
Management unit 09 , Study no: 25

Type	Quadrat Frequency '01	Quadrat Frequency '05	Days use per acre (ha) '01	Days use per acre (ha) '05
Rabbit	25	66	-	-
Elk	10	9	28 (69)	11 (26)
Deer	62	47	175 (431)	37 (91)
Cattle	10	5	28 (68)	29 (72)

BROWSE CHARACTERISTICS --
Management unit 09 , Study no: 25

		Age class distribution (plants per acre)					Utilization					
Year	Plants per Acre (excluding seedlings)	Seedling	Young	Mature	Decadent	Dead	% moderate	% heavy	% decadent	% dying	% poor vigor	Average Height Crown (in)
Artemisia tridentata wyomingensis												
01	**4900**	-	80	2400	2420	980	41	12	49	22	22	19/28
05	**3860**	3680	1020	480	2360	3500	25	44	61	46	47	19/27
Grayia spinosa												
01	**0**	-	-	-	-	-	0	0	-	-	0	-/-
05	**0**	-	-	-	-	-	0	0	-	-	0	24/56
Gutierrezia sarothrae												
01	**0**	-	-	-	-	-	0	0	-	-	0	-/-
05	**0**	-	-	-	-	-	0	0	-	-	0	12/15
Juniperus osteosperma												
01	**0**	-	-	-	-	-	0	0	-	-	0	-/-
05	**20**	-	20	-	-	-	0	0	-	-	0	-/-

		Age class distribution (plants per acre)					Utilization					
Year	Plants per Acre (excluding seedlings)	Seedling	Young	Mature	Decadent	Dead	% moderate	% heavy	% decadent	% dying	% poor vigor	Average Height Crown (in)
Opuntia sp.												
01	**420**	-	40	280	100	-	0	0	24	-	0	3/11
05	**640**	-	20	540	80	-	0	0	13	3	22	4/15